

ABSTRACT

Nuclear medicine is a branch of medical science that utilizes radionuclides in the form of radiopharmaceuticals for the diagnosis and treatment of diseases. This study aims to evaluate the determination of release time for solid radioactive waste at the Nuclear Medicine Installation of Dr. Sardjito General Hospital. The waste investigated consisted of disposable materials contaminated with Iodine-131 (I-131), Technetium-99m (Tc-99m), and Iodine-125 (I-125), which require storage until their radioactivity decreases to a safe level. The research methods included measuring waste mass, radiation dose rate, and surface contamination using calibrated survey meters. The data were analyzed by calculating the net dose rate, corrected for background radiation and calibration factors, and then compared with release criteria based on clearance levels and BAPETEN regulations. The waste can be released when the dose rate is $\leq 1 \mu\text{Sv/h}$ at a distance of 1 meter, the surface contamination is $\leq 1 \text{ Bq/cm}^2$, or the radionuclide activity is below the established clearance levels. The results of this study are expected to provide a basis for evaluating the management of solid radioactive waste in a safe, effective manner and in accordance with radiation protection principles.

Keywords: nuclear medicine, solid radioactive waste, Iodine-131, Technetium-99m, Iodine-125, release time, clearance level, radiation protection.